



Enbridge
5400 Westheimer Court
Houston, Texas 77056

By Electronic Mail

December 10, 2020

Mr. Robert Burrough
Director, Eastern Region
Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation
840 Bear Tavern Road, Suite 300
West Trenton, N.J. 08628

**Re: Algonquin Gas Transmission, LLC
Amended Corrective Action Order, CPF 1-2020-014-CAO
Request for Temporary Removal of Pressure Restriction**

Dear Director Burrough,

Pursuant to the above-referenced Amended Corrective Action Order (ACAO) issued by the Pipeline and Hazardous Materials Safety Administration (PHMSA), Algonquin Gas Transmission LLC (AGT or the Company) has completed a successful restart of the Weymouth Compressor Station, which had been out of service since an emergency shutdown (ESD) system event occurred on September 30, 2020 during commissioning of the station (defined as *Event 2* under the ACAO). AGT is currently operating the Compressor Station at a restricted pressure of 546 psig consistent with ACAO Paragraph 3.

In accordance with the ACAO, AGT enlisted a third party consultant (approved by PHMSA) to facilitate a root cause failure analysis of the September 30, 2020 ESD event which was determined to be caused by a temporary loss of 129 volts direct current (VDC) power to the ESD panel. In addition, since the September 30, 2020 ESD event, AGT has undertaken measures to address the cause of the event as well as numerous conservative mitigative and preventive measures to provide additional assurance for restart and safe operation of the Compressor Station. As described in the attached Repair and Mitigation Summary as well as the Restart Plan (approved by PHMSA on Nov. 25, 2020), AGT undertook mitigative and preventive activities before, during and after the restart of the Compressor Station. The Repair and Mitigation Summary further outlines additional precautionary measures that AGT plans to take in an abundance of caution and in support of PHMSA's consideration of temporarily removing the pressure restriction as allowed under Paragraph 5 of the ACAO.

In light of the above and as set forth in the supporting documentation, AGT respectfully requests that PHMSA approve temporary removal of the pressure restriction on the Weymouth Compressor Station and allow the Compressor Station to temporarily operate up to MAOP pursuant to ACAO Paragraph 5.

CPF 1-2020-014-CAO

December 10, 2020

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Thank you for your consideration of this request. If you have any questions, please do not hesitate to contact me.

Sincerely,



Nathan Atanu
Manager, Operational Compliance
Enbridge Inc.

Attachments

cc: Mr. James Pfeifle, Program Manager (PHMSA)
Mr. Thomas Wooden, Vice President, GTM Engineering and Asset Management
(Enbridge)
Mr. Kyle Hart, Director, Engineering, Reliability and Risk (Enbridge)

ALGONQUIN GAS TRANSMISSION, LLC

Weymouth Compressor Station Repair and Mitigation Summary

CPF No. 1-2020-014-CAO

Appendix 1: Weymouth, Massachusetts Compressor Station Restart Plan (Nov. 9, 2020) (included by reference; previously approved by PHMSA on Nov. 25, 2020).

Restart Plan, Appendix A: Preliminary Direct Causes (included by reference).

Restart Plan, Appendix B: Construction Records Review and Mitigative, Preventive and/or Remedial Actions (included by reference).

Restart Plan, Appendix C: Commissioning Records Review and Mitigative, Preventive and/or Remedial Actions (included by reference).

ALGONQUIN GAS TRANSMISSION, LLC

Weymouth Compressor Station Repair and Mitigation Summary

CPF No. 1-2020-014-CAO

Appendix 2: AGT LLC MA CB Testing 20-04714 prepared by High Voltage Maintenance (Dec. 7, 2020).



Algonquin Gas Transmission LLC
EnBridge MA CB Testing 20-04714
High Voltage Maintenance | HVM

Submitted: December 7, 2020

Purchase Order No. 3500028910
Project No. 1069351

Prepared for:

Algonquin Gas Transmission
9 Bridge St
Weymouth, MA 02191

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1. SUMMARY

- 1.1 This project was initiated by Algonquin Gas. All testing was performed by HVM on November 17, 2020.
- 1.2 Maintenance tests and inspections of electrical equipment help assure proper and safe operation.
- 1.3 Investigative testing was performed for Algonquin Gas.
- 1.4 No deficiencies were found during testing.
- 1.5 Please refer to Section 5 for complete details regarding comments, deficiencies and recommendations.

2. OBJECTIVES

2.1 Maintenance Testing Purpose

- 2.1.1 The equipment and components listed in Section 3 of this report have been inspected and tested to help assure their proper and safe operation. Defective or marginal equipment can be identified, repaired, replaced or scheduled for future repairs without costly or unexpected interruptions during normal operating periods.
- 2.1.2 The test results are particularly valuable when kept for comparison with past and future maintenance test results. This historic database enables one to predict the probability of equipment failure and thus schedule facility production and financial budgets to accommodate preventive maintenance or repair rather than breakdown maintenance.

3. SERVICE DESCRIPTION

- 3.1 This project was initiated by Algonquin Gas. All testing was performed by HVM on November 17, 2020.

4. PROCEDURES

The following procedures were followed in the performance of this project:

4.1 Cables, Low-Voltage, 600-Volt Maximum

4.1.1 Visual and Mechanical

- .1 Inspect exposed sections of cables for physical damage and evidence of overheating.
- .2 Inspect bolted electrical connections for high resistance using one or more of the following methods:
- .3 Use of a low-resistance ohmmeter in accordance with NETA MTS Section 7.3.2.B.1.
- .4 Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA MTS Table 100.12.
- .5 Perform a thermographic survey in accordance with NETA MTS Section 9.
- .6 Inspect compression-applied connectors for correct cable match and indentation.

4.1.2 Electrical Tests

- .1 Perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential shall be 500 volts dc for 300-volt rated cable and 1000 volts dc for 600-volt rated cable. Test duration shall be one minute.
- .2 Verify uniform resistance of parallel conductors.

4.2 Circuit Breakers, Air, Insulated-Case/Molded-Case

4.2.1 Visual and Mechanical

- .1 Inspect physical and mechanical condition.
- .2 Prior to cleaning the unit, perform as-found tests, if required.
- .3 Clean the unit.
- .4 Operate the circuit breaker to insure smooth operation.
- .5 Inspect bolted electrical connections for high resistance using one or more of the following methods:

- .6 Use of a low-resistance ohmmeter in accordance with NETA MTS Section 7.6.1.1.B.1.
- .7 Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA MTS Table 100.12.
- .8 Perform a thermographic survey in accordance with NETA MTS Section 9.
- .9 Inspect operating mechanism, contacts, and arc chutes in unsealed units.
- .10 Perform adjustments for final protective device settings in accordance with the coordination study.
- .11 Perform as left tests.

4.2.2 Electrical Tests

- .1 Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with the circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA MTS Table 100.1.
- .2 Perform a contact/pole-resistance test.
- .3 Determine long-time pickup and delay by primary current injection.
- .4 Determine short-time pickup and delay by primary current injection.
- .5 Determine ground-fault pickup and time delay by primary current injection.
- .6 Determine instantaneous pickup by primary current injection.
- .7 Perform minimum pickup voltage tests on shunt trip and close coils in accordance with NETA MTS Table 100.20.
- .8 Reset all trip logs and indicators.

5. RESULTS, COMMENTS, DEFICIENCIES AND RECOMMENDATIONS

- 5.1 Based on the results of the inspections and tests performed, the equipment included in this project (see detailed test data in Appendix) is considered serviceable.

6. APPENDIX

APPENDIX



Public Version
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Job # 1069351

High Voltage Maintenance
Boston Area Service Center
24 Walpole Park South
Suite 3
Walpole, MA 02081
Phone 508-668-9205

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CUSTOMER ALGONQUIN GAS TRANSMISSION COMPANY

ADDRESS 9 BRIDGE ST; WEYMOUTH MA 02191 JOB # 1069351

OWNER ALGONQUIN GAS TRANSMISSION COMPANY; 9 BRIDGE ST; WEYMOUTH MA 02191

LOCATION/PLANT 9 BRIDGE ST

SUBSTATION EQUIPMENT IDENTIFICATION	DATA TEST FORM EQUIPMENT LOCATION	TEST DATA PAGE #
INVESTIGATION 2 POLE CIRCUIT BREAKERS	15955 - MOLDED CASE CIRCUIT BREAKERS HVM SHOP	1
INVESTIGATION CABLE	12100 - CABLE INSULATION TEST HVM SHOP	2



Public Version
Comments Summary
Job # 1069351

High Voltage Maintenance
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Walpole, MA 02081
Phone 508-668-9205

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CUSTOMER ALGONQUIN GAS TRANSMISSION COMPANY

ADDRESS 9 BRIDGE ST; WEYMOUTH MA 02191

OWNER ALGONQUIN GAS TRANSMISSION COMPANY; 9 BRIDGE ST; WEYMOUTH MA 02191

LOCATION/PLANT 9 BRIDGE ST

JOB # 1069351

Substation: INVESTIGATION

Page: 1

Equipment I.D.: 2 POLE CIRCUIT BREAKERS

Date: 11/17/2020

Equipment: 15955 - MOLDED CASE CIRCUIT BREAKERS

COMMENTS:

Equipment was brought to HVM shop for testing.
Circuit breakers were tested as part of an investigation requested by customer.
1. Circuit breaker was tested via primary injection by passing current through circuit breaker to trip it.
All test results are satisfactory and circuit breaker trips on overload and Instantaneous trip functions.
2. Circuit breaker Insulation Resistance was performed Pole to Ground in closed position and Pole Line side to Pole Load side in open Position.
All test results are satisfactory.
3. Circuit breaker contact resistance was performed for 2 poles and test results are satisfactory.
Phase 'A' and phase 'B' represent Pole 1 and Pole 2 on 2 pole circuit breaker.

Substation: INVESTIGATION

Page: 2

Equipment I.D.: CABLE

Date: 11/17/2020

Equipment: 12100 - CABLE INSULATION TEST

COMMENTS:

Equipment was brought to HVM shop for testing.
Cable was inspected for external damage such as bends, cuts etc. No visual damage was found. Continuity of each phase was verified.
Cable insulation resistance was tested Phase to Phase and Phase to Ground with other 2 phases not included in test grounded.
Test results are satisfactory.
A represents Black wire
B represents Red wire
C represents Blue wire



MOLDED CASE CIRCUIT BREAKER TEST MULTI-DEVICE FORM

Public Version

High Voltage Maintenance
Boston Area Service Center
24 Walpole Park South
Suite 3
Walpole, MA 02081
Phone 508-668-9205

CUSTOMER ALGONQUIN GAS TRANSMISSION COMPANY Page 1 of 2
ADDRESS 9 BRIDGE ST; WEYMOUTH MA 02191 JOB # 1069351
OWNER ALGONQUIN GAS TRANSMISSION COMPANY; 9 BRIDGE ST; WEYMOUTH MA 02191
LOCATION/PLANT 9 BRIDGE ST DATE LAST INSPECTION NA
DATE 11/17/2020 TEMPERATURE 20 °C HUMIDITY 28 % EQPT. LOCATION HVM SHOP
SUBSTATION INVESTIGATION EQUIPMENT I.D. 2 POLE CIRCUIT BREAKERS

BREAKER IDENTIFICATION	MANUFACTURER		TYPE	FRAME RATING	TRIP RATING	INSTANTANEOUS	MIN TIME	MAX TIME	
	Eaton		GHB2020	20A	20A	FIXED	20	75	
CIRCUIT BREAKER 0001-20 SERIAL # 7920170214144945	CONTACT RESISTANCE (MILLIOHMS)			TRIP TIME IN SECONDS @ 300% RATED CURRENT			INSTANTANEOUS TRIP AMPS		
	A	B	C	A	B	C	A	B	C
	3.718	3.893		20	22		250	255	
	INSULATION RESISTANCE @ 1000VDC IN MEGOHMS								
	A - B	B - C	C - A	A - GND	B - GND	C - GND	A - A	B - B	C - C
	1,000,000			1,000,000	1,000		1,000	1,000	

BREAKER IDENTIFICATION	MANUFACTURER		TYPE	FRAME RATING	TRIP RATING	INSTANTANEOUS	MIN TIME	MAX TIME	
	CBI		QY-2(13)	20A	20A	FIXED	2	8	
CIRCUIT BREAKER 0002-20 QY-2(13)-DM-U2-20A-B1 RE-ORDER # QY29U220B1 DC Breaker	CONTACT RESISTANCE (MILLIOHMS)			TRIP TIME IN SECONDS @ 300% RATED CURRENT			INSTANTANEOUS TRIP AMPS		
	A	B	C	A	B	C	A	B	C
	12.67	10.12		6	4		108	118	
	INSULATION RESISTANCE @ 1000VDC IN MEGOHMS								
	A - B	B - C	C - A	A - GND	B - GND	C - GND	A - A	B - B	C - C
	120,000			1,000,000	1,000,000		530,000	137,000	

BREAKER IDENTIFICATION	MANUFACTURER		TYPE	FRAME RATING	TRIP RATING	INSTANTANEOUS	MIN TIME	MAX TIME	
	CONTACT RESISTANCE (MILLIOHMS)			TRIP TIME IN SECONDS @ 300% RATED CURRENT			INSTANTANEOUS TRIP AMPS		
	A	B	C	A	B	C	A	B	C
	INSULATION RESISTANCE @ 1000VDC IN MEGOHMS								
	A - B	B - C	C - A	A - GND	B - GND	C - GND	A - A	B - B	C - C

COMMENTS:

Equipment was brought to HVM shop for testing.
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Phase 'A' and phase 'B' represent Pole 1 and Pole 2 on 2 pole circuit breaker.

DEFICIENCIES & RECOMMENDATIONS:

EQPT. INVENTORY NO. MS-2, MEGGER MIT-515, AEMC 6240

TESTED BY: Fartushin, Artem



CABLE INSULATION TEST

High Voltage Maintenance
Boston Area Service Center
24 Walpole Park South
Suite 3
Walpole, MA 02081
Phone 508-668-9205

CUSTOMER

ALGONQUIN GAS TRANSMISSION COMPANY

ADDRESS

9 BRIDGE ST; WEYMOUTH MA 02191

OWNER

ALGONQUIN GAS TRANSMISSION COMPANY; 9 BRIDGE ST; WEYMOUTH MA 02191

LOCATION/PLANT

9 BRIDGE ST

DATE LAST INSPECTION

NA

DATE

11/17/2020

TEMPERATURE

20 °C

HUMIDITY

28 %

EQPT. LOCATION

HVM SHOP

SUBSTATION

INVESTIGATION

EQUIPMENT ID.

CABLE

NOTES

TEST VOLTAGE 1 KVDC

CIRCUIT IDENTIFICATION	NO. & COND. SIZE	INSUL. TYPE	FROM		INSULATION RESISTANCE (ALL TEST RESULTS IN MEGOHMS)						
			TO		A - GND	B- GND	C- GND	N- GND	A - B	B - C	C - A
CABLE P823B Tag "129 DC SPARE"	3 WIRE/12AWG	THHN	NA		18,870	17,810	26,900		19,870	273,000	271,000
			NA								

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DEFICIENCIES & RECOMMENDATIONS: